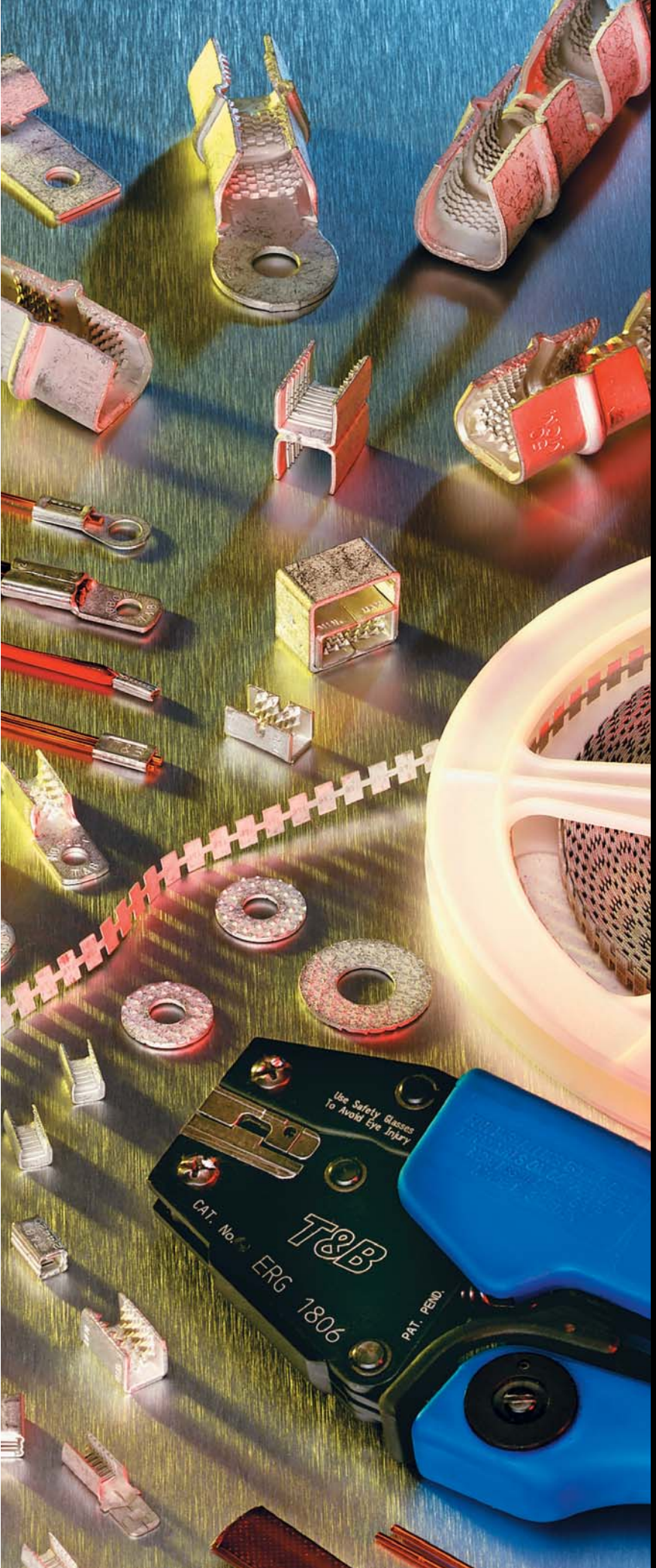

Dragon Tooth®

Insulation Piercing Connectors for Magnet Wire

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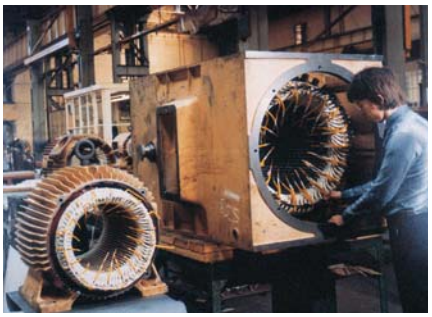
Dragon Tooth®
Insulation Piercing Connectors

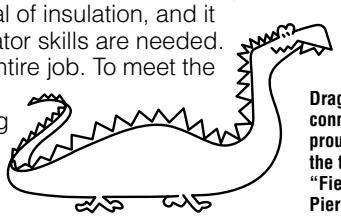


Transformer manufacturers depend on Dragon Tooth® connectors for reliable magnet wire applications.

The tough, high temperature insulation on magnet wire used by electrical motor and transformer manufacturers creates problems in splicing and terminating. The durability of magnet wire insulation has made dip-soldering or brazing extremely difficult without stripping the insulation.

Another splicing and terminating challenge involves the use of aluminum for magnet applications. A manufacturer connecting aluminum magnet wire to copper is faced with the problem of the different coefficients of thermal expansion of the two metals, galvanic corrosion, cold flow and the rapid formation of oxide film on the wire surface.

T&B offers a solution for a highly reliable connection method for magnet wire. It eliminates welding, no longer requires removal of insulation, and it can be installed in seconds. No special operator skills are needed. The connector and matching tooling do the entire job. To meet the essential requirements of magnet wire connections, T&B offers the insulation piercing DRAGON TOOTH® compression connector.



Dragon Tooth connectors proudly earn the title "Fierce Pierce.™"

Dragon Tooth® Magnet Wire Connectors

Thomas & Betts Dragon Tooth® connectors and installing tools are designed to splice, tap and terminate magnet wire from 32 AWG to 460,000 CMA copper and from 20 AWG to 460,000 CMA aluminum conductors in motor and transformer applications. Dragon Tooth® Magnet Wire Connectors penetrate the insulation and oxide layers to make electrical contact on magnet wiring. The result is permanent, low resistance electrical connections, capable of maintaining contact integrity throughout the life of the connection.

Typical Applications

Splice

Termination

Parallel Splice

Tap

- Designed to penetrate magnet wire insulation during application, eliminating the need for stripping, brazing, welding or other methods of joining magnet wire.
- Can be installed in seconds.
- Requires minimal training for installation.
- Made of copper alloy, tin plated, with a number of teeth on the inner surface.
- Splices and taps have an open side permitting easy access to wire and makes internal coil tapping possible.
- For aluminum to copper, aluminum to aluminum, or copper to copper magnet wire connections.
- Supplied with bolt holes to accommodate No. 6 through 1/2" studs and includes male and female .250 x .032" disconnects.
- Splices and fork terminals accommodate wire sizes 24 AWG to 12 AWG in a variety of combinations, including combining magnet wire with stripped wire lead. For solid or stranded wire #20 to #4/0 AWG.
- Larger connectors accommodate circular mil range from 50,000 to 460,000 cm.
- Teeth on the transition washers penetrate aluminum and copper oxides, enabling copper to aluminum connections to be made in a bolted joint without the use of inhibiting compounds. Transition washers also accommodate the difference in thermal expansion between copper and aluminum, and enhance the efficiency of bolted grounding connections.
- Connector and matching tooling do the entire job.

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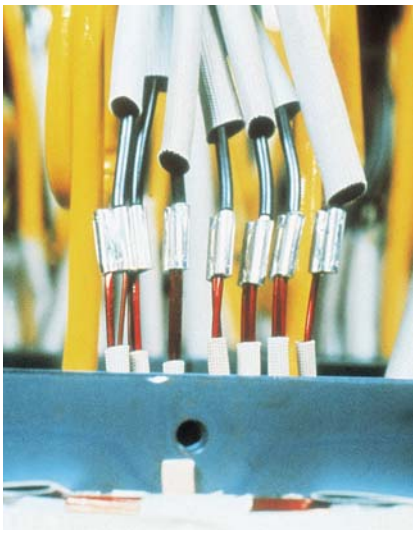
Dragon Tooth®
Insulation Piercing Connectors



DRAGON TOOTH® connectors transform the perpendicular compression force, which would normally contribute to conductor creep, into distributive forces that effectively resist cold flow, as indicated by the illustration below.

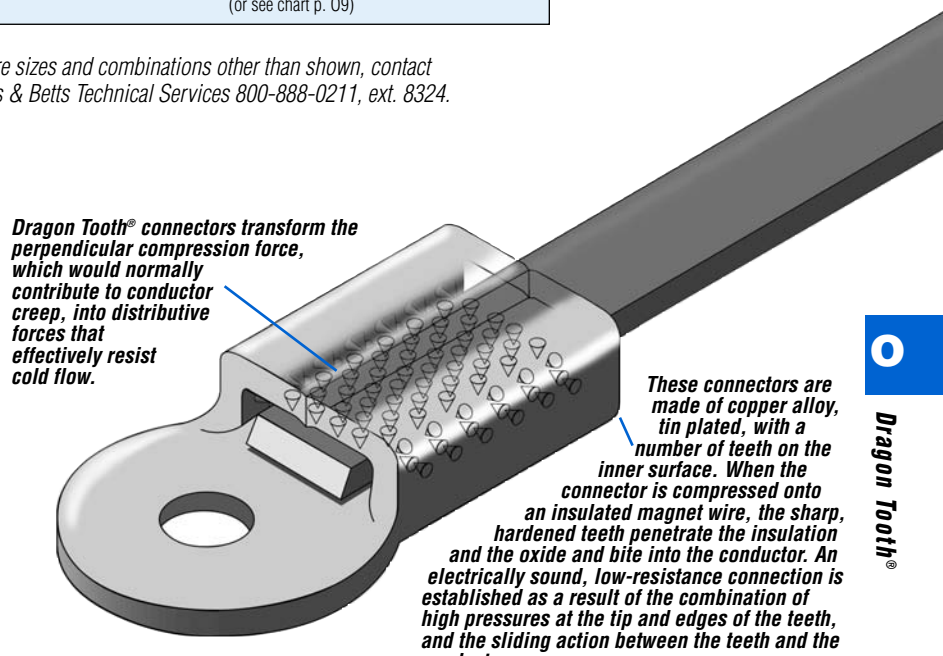
These connectors are made of copper alloy, tin plated, with a number of teeth on the inner surface. When compressed onto an insulated magnet wire, the sharp, hardened teeth penetrate both the insulation and oxide and bite into the conductor. An electrically sound, low-resistance connection is established as a result of the combination of high pressures at the edges of the teeth, and the sliding action between the teeth and the conductor. The open barrel design permits midspan splicing and tapping.

How to Select a Connector

1. Determine total circular mil area (CMA). All wires to be installed in a connector barrel including stripped, stranded wire. Eg., two #6 AWG = 52480CMA.
2. Refer to Circular Mil column of chart and find the connector series corresponding to the total CMA. eg., 204XXX.
3. Next, refer to either Round Wire column, or Rectangular Wire column, depending on the type you are using, and check for any limitations, (such as max. wire i.e. width/height). If there are limitations, you may have to make a selection from the next larger size.
4. Select the tool and die appropriate for the application.

Formula for calculating circular mil area (CMA)	
Square or rectangular wire:	Thickness x Width x 1.273 x 10^6 = CMA
Round wire:	Diameter^2 x 10^6 = CMA (or see chart p. O9)

For wire sizes and combinations other than shown, contact Thomas & Betts Technical Services 800-888-0211, ext. 8324.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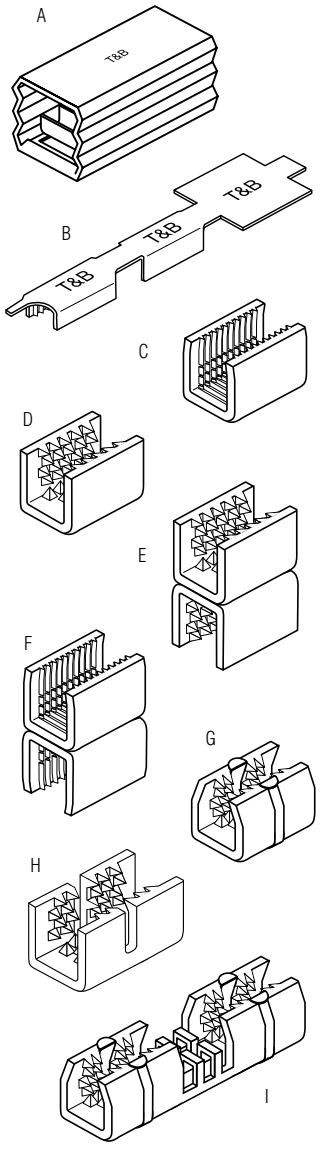
Selection of Connectors and Application Tools

The connectors on these pages will penetrate all standard copper and aluminum magnet wire insulations such as: heavy Formvar, poly-thermaleze, polyester, polyurethane, etc. For special insulations, consult Technical Services.



Splices

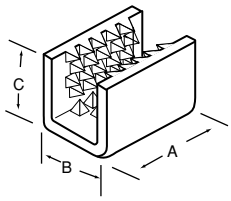
	Catalog Number	Dimensions A	B	C*	Circular Mil Area	Round Wire Range, AWG Min Max	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
Ⓐ	**214420**	.43	.25	.22	–	21 (4) - 12 (2)	–	–	1000
Ⓑ	**220004**	.17	.11	.03	468 - 1,724	32 - 24**	–	–	†8400†
	220001	.34	.17	.09	1,277 - 4,205	26 - 17**	.02 - .04	.02 - .09	†3000†
	220002-TB	.34	.25	.09	2,985 - 6,687	24 - 14**	.02 - .05	.02 - .10	†3000†
	220006	.47	.25	.09	5,162 - 12,330	16 - 12	.05 - .08	.05 - .16	†2500†
Ⓒ	**22L004**	.15	.11	.03	128 - 2,028	32 - 24**	–	–	1000
	22L001	.32	.16	.10	808 - 5,162	26 - 17**	.02 - .04	.02 - .10	1000
	22L002	.32	.25	.10	2,048 - 9,110	24 - 15**	.02 - .05	.02 - .11	1000
	22L006	.45	.25	.13	2,580 - 12,330	16 - 12	.05 - .08	.05 - .16	1000
	22L008	.70	.50	.12	12,960 - 30,550	18 - 14	.04 - .06	.06 - .38	100
	22L009	.70	.55	.20	36,120 - 86,000	16 - 5	.08 - .18	.08 - .38	100
	22L010								
Ⓓ	**210214S**	.63	.38	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
	204210S	.69	.53	.25	10,380 - 52,480	12(b) - 2(e)	.10 - .16	.10 - .26	100
Ⓔ	**204210SH**	.69	.53	.47	20,760 - 104,960	12(c) - 2(d)	.10 - .16	.10 - .26	100
Ⓕ	**22L009H**	.70	.55	.38	72,000 - 132,000	16 - 5	.08 - .18	.08 - .38	100
Ⓖ	**220015**	1.50	.88	(e)	50,000 - 115,000	–	.100 - .175	.300 - .625	50
	220019	1.50	.88	(e)	110,000 - 175,000	–	.175 - .325	.300 - .625	25
	220023	1.75	.88	(e)	110,000 - 230,000	–	.175 - .325	.300 - .625	25
Ⓗ	**314118S**	.63	.38	.13	3,260 - 12,330	15 - 13	.05 - .06	.05 - .18	250
Ⓘ	**220016**	3.13	.88	(e)	100,000 - 230,000	–	.100 - .175	.300 - .625	25
	220020	3.13	.88	(e)	220,000 - 350,000	–	.175 - .325	.300 - .625	25
	220024	3\.63	.88	(e)	220,000 - 460,000	–	.175 - .325	.300 - .625	25

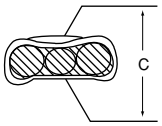
*Reference dimension. See installing die illustration for gauging.

** Not recommended for aluminum magnet wire finer than 21 gauge. (a) Four wires max. (b) Six wires max. (c) Six wires max. each barrel (d) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance. (e) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel. Pump must deliver 9800 psi minimum.

† On a reel

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.





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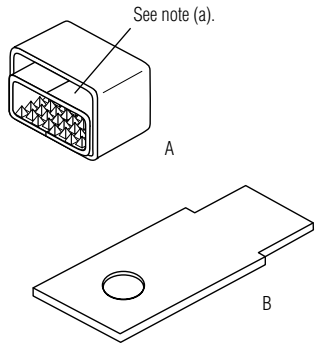
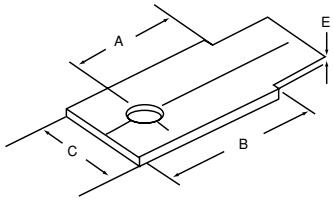


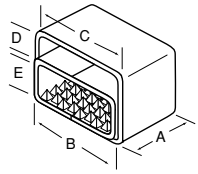
Splices (Continued)

	Catalog Number	Stud Size	Dimensions, Inches A	B	C	D	E	Circular Mil Area	Round Wire Range, AWG	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
Ⓐ	**210214MT**	–	.63	.63	.75	.25	.19	20,000 - 105,000	5 - 13	Lower Half .08 - .15	.08 - .49	250
										Upper Half .25 max	.75 max.	
Ⓑ	**210MT14**	1/4	1.00	1.44	.82	–	.09		5 - 13	For Conn		25
	210MT38	3/8	1.00	1.44	.82	–	.09		5 - 13	210214MT		25
Ⓐ	**204210MT**		.69	.94	1.03	.25	.25	90,000 - 215,000	3 - 10	Lower Half .10 - .25	.10 - .92	100
										Upper Half .25 max	1.03 max.	
Ⓑ	**204MT14**	1/4	1.00	1.44	.91	–	.12		3 - 10	For Conn		25
	204MT38	3/8	1.00	1.44	.91	–	.12		3 - 10	204210MT		25

(a) This space may be used for terminal tongue insert, stripped stranded copper wire, stripped copper magnet wire, or left empty.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.





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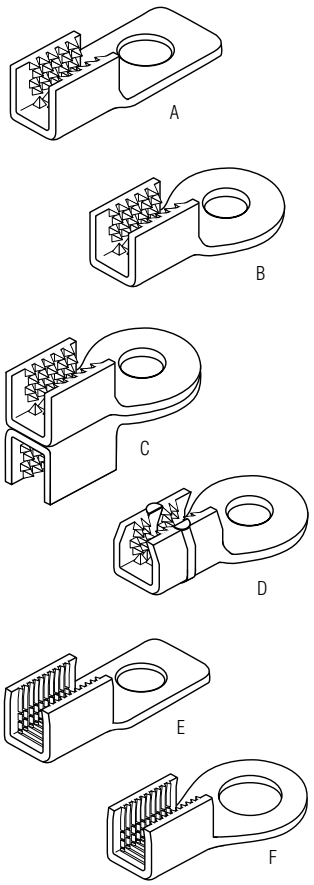
Insulation Piercing Connectors



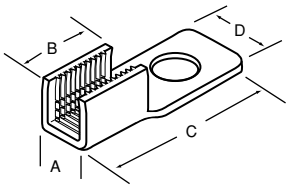
Ring Terminals

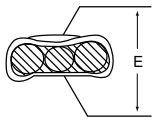
	Catalog Number	Stud Size	Dimensions, Inches A	B	C	D	E*	Circular Mil Area	Round Wire Range, AWG	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
Ⓐ	**314125**	10	.38	.31	.56	.04	.27	3,260 - 12,330	15 - 13	.05 - .06	.05 - .18	250
	314123	1/4	.38	.31	.56	.04	.27	3,260 - 12,330	15 - 13	.05 - .06	.05 - .18	250
	210219	8	.38	.56	1.22	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
Ⓐ	**210217**	10	.38	.56	1.22	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
	210216	1/4	.38	.56	1.41	.41	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
	204217	10	.53	.61	1.58	.50	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
Ⓐ	**204212**	1/4	.53	.61	1.58	.50	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
	210214-1	1/4	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
Ⓑ	**210214-2**	5/16	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
	210214-3	3/8	.38	.56	1.41	.69	.17	4,110 - 20,760	14(a) - 10	.08 - .09	.08 - .18	250
	204210-1	1/4	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
Ⓑ	**204210-2**	5/16	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
	204210-3	3/8	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
	204210-5	1/2	.53	.61	1.58	.81	.25	10,380 - 52,480	12(b) - 2(c)	.10 - .16	.10 - .26	100
	204210-1H	1/4	.53	.61	1.58	.81	.47	20,760 - 104,960	12(b) - 2(c)	.10 - .16	.10 - .26	100
Ⓒ	**204210-3H**	3/8	.53	.61	1.58	.81	.47	20,760 - 104,960	12(b) - 2(c)	.10 - .16	.10 - .26	100
	220017	3/8	.88	1.50	2.76	1.06	(d)	50,000 - 115,000	.100 - .175	–	.300 - .625	25
	220018	1/2	.88	1.50	2.76	1.06	(d)	50,000 - 115,000	.100 - .175	–	.300 - .625	25
Ⓓ	**220021**	3/8	.88	1.50	2.76	1.06	(d)	110,000 - 175,000	–	.175 - .250	.300 - .625	25
	220022	1/2	.88	1.50	2.76	1.06	(d)	110,000 - 175,000	–	.175 - .250	.300 - .625	25
	220025	3/8	.88	1.50	2.76	1.06	(d)	110,000 - 230,000	-	.175 - .325	.300 - .625	25
	220026	1/2	.88	1.50	2.76	1.06	(d)	110,000 - 230,000	-	.175 - .325	.300 - .625	25
	22R061**	6	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
Ⓔ	**22R081****	8	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
	22R101**	10	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
	22R086	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
Ⓔ	**22R106**	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
Ⓕ	**22R146**	1/4"	.25	.45	.95	.42	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
	22L010*											

*Reference dimension. See installing die illustration for gauging. (a) Four wires max. (b) Six wires max. (c) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance. (d) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel. Pump must deliver 9800 p.s.i. minimum.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.

**22 - 24 AWG and equivalent rectangular c.m.a., copper only.





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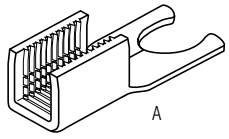
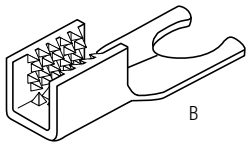
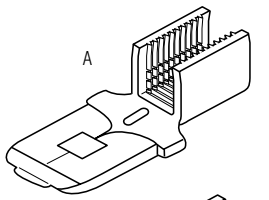
Dragon Tooth®
Insulation Piercing Connectors

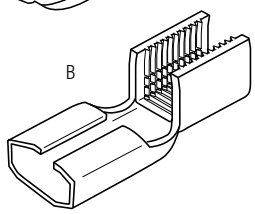




Fork Terminals

	Catalog Number	Stud Size	Dimensions, Inches A	B	C	D	E*	Circular Mil Area	Round Wire Range, AWG	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
	22F061**	6	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
	22F081**	8	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
	22F101**	10	.16	.32	.78	.30	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
A	**22F066**	6	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
A	**22F086**	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
A	**22F106**	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
B	**210219F**	6	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
B	**210217F**	8	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
B	**210216F**	10	.25	.45	.91	.30	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000





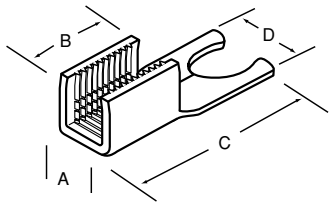
Disconnects

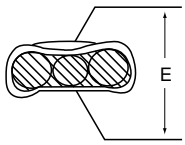
	Catalog Number	Tab Size	Dimensions, Inches A	B	C	D	E*	Circular Mil Area	Round Wire Range, AWG	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
A	**22LM01****	.250 x .032	.16	.32	.76	.25	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
A	**22LM06**	.250 x .032	.25	.45	.91	.25	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000
B	**22LF01****	.250 x .032	.16	.32	.79	.25	.10	404 - 4100	15 - 24	.02 - .05	.02 - .10	1000
B	**22LF06**	.250 x .032	.25	.45	.91	.25	.13	2,580 - 12,330	12 - 16	.05 - .08	.05 - .16	1000

*Reference dimension. See installing die illustration for gauging. (a) Four wires max. (b) Six wires max. (c) Conductors heavier than 6 AWG require special dies. Contact Thomas & Betts for assistance. (d) Crimping dies may not bottom. Connector height will depend on number and size of wires in barrel.

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.

**22-24 AWG and equivalent rectangular c.m.a., copper only.





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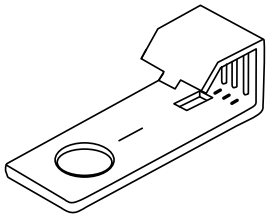
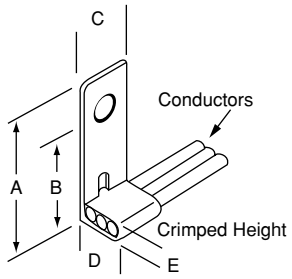
Dragon Tooth®
Insulation Piercing Connectors



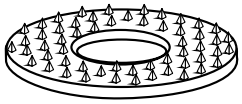
Taps

Catalog Number	Stud Size	Dimensions, Inches A	B	C	D	E*	Circular Mil Area	Round Wire Range, AWG	Rectangular Wire Range, Inches Thickness	Width	Pkg. Qty.
204T14	1/4	1.62	1.22	.70	.50	.22	10,310 - 52,480		.090 - .114	.090 - .320	100
204T38	3/8	1.62	1.22	.70	.50	.22	10,310 - 52,480		.090 - .114	.090 - .320	100

*Reference dimension. See installing die illustration for gauging.



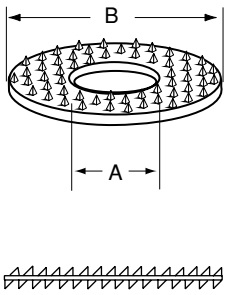
Washers

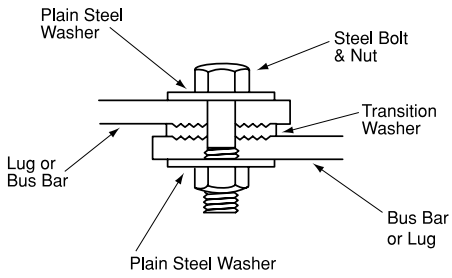


Catalog Number	Bolt Size, Inches	Dimensions, Inches A	B	Recommended Installing Torque In-Lbs.	Pkg. Qty.
FPW14	1/4	.27	.68	50 - 80	250
FPW516	5/16	.34	1.00	125 - 160	250
FPW38	3/8	.43	1.00	160 - 240	250
FPW12	1/2	.56	1.25	390 - 540	250
FPW58	5/8	.68	1.40	540 - 730	250

- ***Teeth on the transition washers penetrate aluminum and copper oxides, enabling copper to aluminum connections to be made in a bolted joint without the use of inhibiting compounds. Transition washers also accommodate the difference in thermal expansion between copper and aluminum, and enhance the efficiency of bolted grounding connections.***

NOTE: Wire sizes and combinations shown have been tested to and meet or exceed Thomas & Betts specifications. Connectors may be suitable for other wire sizes or combinations. Thomas & Betts sells these connectors with the understanding that the user will perform necessary tests to determine their suitability for the intended purpose.





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Additional Magnet Wire Ordering Information

1. For wire sizes and combinations other than shown, consult factory.
2. Maximum of two layers of conductors in each connector.
3. Consult factory for gauging other than shown.
4. When terminating wires with an AWG size difference of four or more, samples should be tested in completed connections before using.

Conversion of AWG to Circular Mils

Wire Size AWG	Nom. Diameter Inches	Nom. Diameter MM	Circular Mils	Wire Size AWG	Nom. Diameter Inches	Nom. Diameter MM	Circular Mils
4/0	.4600	11.68	211600	11	.0907	2.30	8230
3/0	.4096	11.40	167800	12	.0808	2.05	6530
2/0	.3648	9.266	133100	13	.0720	1.83	5180
1/0	.3249	8.52	105600	14	.0641	1.63	4110
1	.2893	7.348	83690	15	.0571	1.45	3260
2	.2576	6.543	66360	16	.0508	1.29	2580
3	.2294	5.827	52620	17	.0453	1.15	2050
4	.2043	5.189	41740	18	.0403	1.02	1620
5	.1819	4.620	33090	19	.0359	0.912	1290
6	.1620	4.115	26240	20	.032	.813	1020
7	.1443	3.665	20820	21	.0285	.724	812
8	.1285	3.264	16510	22	.0253	.643	640
9	.1144	2.906	13090	23	.0226	.574	511
10	.1019	2.588	10380	24	.0201	.511	404

Decimal Equivalents

Wire Size AWG	Nom. Diameter Inches	Nom. Diameter MM	Circular Mils	Wire Size AWG	Nom. Diameter Inches	Nom. Diameter MM	Circular Mils
1/64	.0156	3/16	.1875	11/32	.3438	33/64	.5156
1/32	.0312	13/64	.2031	23/64	.3594	17/32	.5312
3/64	.0469	7/32	.2188	3/8	.375	35/64	.5469
1/16	.0625	15/64	.2344	25/64	.3906	9/16	.5625
5/64	.0784	1/4	.25	13/32	.4062	37/64	.5781
3/32	.0938	–	–	27/64	.4219	19/32	.5938
7/64	.1094	17/64	.2656	7/16	.4375	39/64	.6094
1/8	.125	9/32	.2812	29/64	.4531	5/8	.625
9/64	.1406	19/64	.2969	15.32	.4688	41/64	.6406
5/32	.1562	5/16	.3125	31/64	.4844	21/32	.6562
11/64	.1719	211/64	.3281	1/2	.5	43/64	.6719

NOTE: Multiply inches x 25.4 to get millimeters.
Example: 0.5" x 25.4 = 12.7 mm.

Stud Size	#6	#8	#10	1/4"	5/16"	3/8"	1/2"
Hole Dia.	.143	.169	.196	.260	.323	.386	.516

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Manual Installing Tools

These tools are suitable for prototyping and limited production usage. They are equipped with a Shure-Stake® mechanism which requires full closure of the dies before release. Makes butt and parallel splices, taps, and terminations. Dies are self-contained. Operated manually.

ERG1806

NEW

Features:

- ***Incorporates the ergonomically designed Comfort Crimp™ tool handles which distribute the force more evenly across the hand.***
- ***Shure-Stake® mechanism ensures a complete crimp cycle before the tool releases.***
- ***Rubberized thermoplastic handles combine maximum friction with a soft, comfortable feel that reduces muscle tension.***
- ***Two-piece movable die nest provides easy connector removal.***

Ergonomic Manual Installing Tool

Cat. No.	Description	Tool Gauging	Connector
ERG1801	Ergonomic Comfort Crimp™ Hand operated crimping tool utilizing non-interchangeable dies for installing T&B insulation piercing connectors on magnet wire.	.069 max.	22F, L, R-1 Series
ERG1802		.076 max.	22L002
ERG1804		.034 max.	22L004
ERG1806		.095 max.	22F, L, R-6 Series

- Contact Customer Services for availability and most recent additions to the ergonomic tool series.

ERG811

Cat. No.	Description	Connector
ERG811	Ergonomic Comfort Crimp™ Hand operated crimp tool with single die for installing T&B insulation piercing connectors on magnet wire.	214420
WT811	Hand operated crimping tool with single die for installing T&B insulation piercing connectors on magnet wire.	214420

Specifications:
Weight: 1 Lb.
Material: High Strength Steel

Maintenance:
1. Occasional light oiling.

WT811

Features:

- ***Incorporates a Shure-Stake® mechanism which will not allow the dies to open until preset crimping is reached.***
- ***Single die nest for 214420 connector only.***

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Dragon Tooth®
Insulation Piercing Connectors

Power Operated Installing Tools

There's a portable crimping tool that is designed to reduce the stress traditional hand tools put on wrist muscles. Thomas & Betts ERG 3000 uses battery-powered hydraulics instead of muscle power to install Dragon Tooth terminals safely and securely.

In addition, our power crimping tool is engineered to substantially reduce the weight in the tool head, which is in the user's hand, to further reduce fatigue. Because the ERG 3000 is constructed with the battery in the separate base unit, the tool head itself is very light and compact – enabling it to operate in tight quarters other power tools can't reach.

Because there is no manual or physical force required, the ERG 3000's ergonomic design dramatically reduces the risk of carpal tunnel syndrome that can occur with repetitive hand-crimping. And, by significantly reducing muscle fatigue, the ERG 3000 can lead to increased productivity over traditional hand crimping tools.

Tests conducted showed that the ERG 3000 increased productivity more than 50% when used in actual working situations.

Short cycle times help speed work.

Depending on the size of the terminal being installed, the ERG 3000 has an exceptionally fast cycle time of just one to three seconds. Add this to its ergonomic design and convenient portability, and you have a tool that makes installing Dragon Tooth connectors terminals faster and easier than ever.

- ***Die release knob cuts power to the tool head and protects fingers when changing die sets.***
- ***Quickly interchangeable dies accommodate Dragon Tooth 22XXX1, 22XXX2, and 22XXX6 series connectors.***
- ***LEDs on tool head indicate when a work cycle is complete and the tool head is ready.***
- ***Low force actuating button initiates and completes the crimping work cycle.***
- ***Swiveling tool head allows positioning for maximum comfort and convenience.***
- ***Control lever opens the dies, allowing terminal to be inserted for crimping.***
- ***Tough PanaVise™ benchmount clamp holds tool head securely.***
- ***Base power unit houses the hydraulic pump, fluid reservoir, and electronic control unit. Closed system for low maintenance.***
- ***Easy-to-see lamps indicate when the ERG 3000 is ready to operate.***
- ***Separate AC adapter can be used for bench mount or stationary application.***
- ***Foot pedal allows for "hands-free" crimping, resting wrists and allowing for increased speed.***

Technical data for the ERG 3000

Base Unit

Working pressure	3625 psi
Power supply	NiCd Battery 12 V DC or AC/DC converter 110 V 60 Hz
Work cycle	1-3 seconds
Weight (with battery)	11 lb. (without tool/hose pack)
Dimensions	13.77" L x 7.28" W x 5.12" D
Temperature range	-4˚ to 122˚ F

Tool Head Assembly

Press force	3372 lb.
Weight (tool only)	1.65 lb.
Diameter of handle	1.61 in.
Length of handle	8.86 in.
Length of hose	7.22 ft.

Battery

Type	NiCd 12 V, rechargeable
Recharging time	15 min.
Number of recharges	1000

Standard Components

Cat. No.	Description	Wt. (lb.)
ERG-3001*	Base Unit	11.0
ERG-3002*	Hose & Tool Head Assembly	3.5
ERG-3003	NiCd Battery	1.3
ERG-3004	15 min. Battery Charge	3.0
ERG-3005	Carrying Case	6.3
ERG-3006	AC Adapter	7.0
ERG-3007	Benchmount	1.0
ERG-3008	Foot Switch	2.5
ERG-3000	Complete Kit (see note below)	26.4

*Cannot be purchased separately.

Dies for ERG-3000*

Cat. No.	Connector	Die Gauging Max.	Die Gauging Min.
ERG202	22XXX2 Series	.072	.068
ERG206	22XXX6 Series	.090	.086

ERG3000 also accepts dies for T&B Sta-Kon® 22-8AWG, insulated and non-insulated terminals. Please contact your sales representative for a complete catalog of quality Sta-Kon termination products.
*Check with customer service for availability of dies.

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Dragon Tooth®
Insulation Piercing Connectors

11903A

Air Hydraulic Tool

Cat. No.	Description
11903A	Open "C" yoke; hand actuated
11904A	Open "C" yoke; foot actuated
11913	Airhose, 8' long with fittings
11930	Foot valve for 11904A

Cat. No. 11904A also requires two (2) Cat. No. 11913 air hoses and one (1) Cat. No. 11930 foot valve.
Overall length 10-7/8"
Diameter 2-1/4"
Operating Pressure 90-100 PSI
Weight 3 lbs.

13500

Air Operated—Bench Mounted Tools

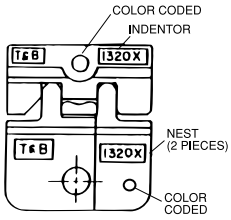
Cat. No.	Description	Std. Pkg.
13500	Heavy duty, high speed production tool installs a wide range of Dragon Tooth connectors. Equipped with Shure-Stake® mechanism ensuring full crimp cycle before release. All metallic construction. Supplied with foot pedal, air hose-air/lubricator.	1

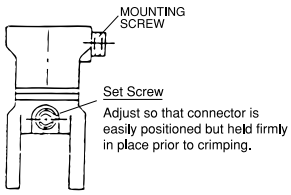
Height 12"
Base 8" Square
Weight 17 Lbs.
Operating Pressure 85-90 PSI.
Includes hoses, foot pedal and air treatment system.

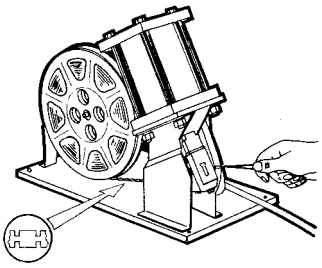
Installing Dies for 11903A, 11904A & 13500 Tools

Cat. No.	Connector	Die Gauging	
		Max.	Min.
13201	22XXX1 Series	.066	.062
13202	22XXX2 Series	.072	.068
13206	22XXX6 Series	.090	.086

11903A, 11904A, and 13500 also accepts dies for T&B Sta-Kon® 22-10AWG, insulated and non-insulated terminals. Please contact your sales representative for a complete catalog of quality Sta-Kon termination products.







Auto-Feed Tool for Magnet Wire Connectors on Strip

Pneumatic bench mounted foot operated tool for crimping copper or aluminum magnet wire and copper lead wire, not solder dipped or bonded.

Tool Cat. No.	Connector Cat. No.	Quantity Per Reel	Tool Weight	Tool Size		
				WD	DP	Ht
13676A	220004	9000	19 lbs.	5"	14"	11"
13678	220001	3000	28 lbs.	6"	18"	14"
13679	220002	3000	28 lbs.	6"	18"	14"
13696	220006	2500	32 lbs.	6"	18"	16"

Features:

- ***Operates on 85 min. PSI air supply.***
- ***Foot pedal contains T&B Shure-Stake® control mechanism which ensures a full compression each time.***
- ***Insulation piercing connectors are fed on a continuous reel mounted strip.***
- ***Dies are self-contained. Includes foot valve, hoses and air treatment system.***

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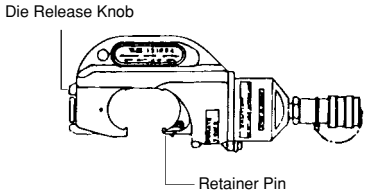
• Includes carrying case.

14 Ton Hydraulic Head

Cat. No.	Description
13100A	Remote 14 ton hydraulic head. Dies ordered separately.

Output	14 tons (nominal)
Hydraulic Operating Pressure	10,000 psi (max.)
Length (with coupling)	11½ in.
Width	2½ in.
Height	4¼ in.
Piston Dia.	1.812 in.
Piston Stroke	1.5 in. max.
Weight (without dies)	10 lbs.

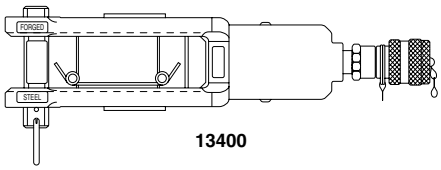


See die chart on page FO15 for complete listing of dies and connectors used with 13100A.

12 Ton Crimping Tool

Cat. No.	Description	Std. Pkg.
13400	Twelve ton crimping tool (dies ordered separately).	1

Output	12 tons (nominal)
Hydraulic Operating Pressure	10,000 psi (max.)
Length (with coupling)	14½ in.
Width	3¼ in.
Weight (without dies)	15 lbs.

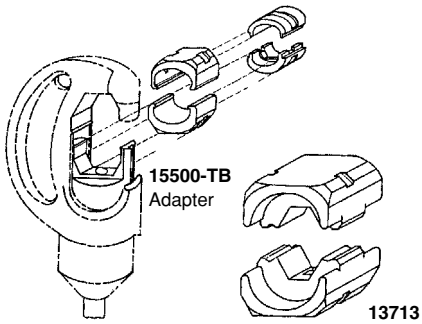


See die chart on page O15 for complete listing of dies and connectors used with 13400.

15 Ton Hydraulic Tool

Cat. No.	Description
TBM15	15 ton hydraulic tool; carrying case included.

Output Force:	15 tons nominal
Operating Pressure:	10,000 psi nominal
Cylinder:	2 in. dia.
Tool Weight:	15½ lbs. (without dies)
Installs	8 AWG - 1000 MCM Copper 10 AWG - 1000 MCM Aluminum



Features:

- ***New longer, slimmer profile allows easier access into tight spaces.***
- ***Wider jaw opening eases crimping of larger connectors.***
- ***Available with an insulated head and runs off of existing 10,000 PSI hydraulic pumps.***
- ***Includes steel carrying case. Tool weight is 14 pounds.***

See die chart on page O15 for complete listing of dies and connectors used with TBM15.

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Dragon Tooth®
Insulation Piercing Connectors

- *Lightweight design*
- *Weighs less than 7 lbs. including dies.*
- *Includes steel carrying case.*

6 Ton Hydraulic Head

Cat. No.	Description
TBM6H	The TBM6H Remote Hydraulic Crimping Head is a lightweight but powerful compression tool. The TBM6H operates from any 10,000 psi hydraulic pump.

Output Force	6 tons nominal
Operating Pressure:	10,000 PSI Nominal (Safety By-Pass on pump set at 9800 PSI)
Tool weight:	6-1/2 lbs. (without dies)
Tool dimensions:	13-1/2 in. long, 3-1/2 in. wide
Tool carrying case included	
Dies are ordered as a set (2 pieces)	
Upper & lower dies are identical	

See die chart on page O15 for complete listing of dies and connectors used with TBM6H.

13810

Electric Hydraulic Pump

Cat. No.	Description
13810	Electric hydraulic pump, 10000 psi with Shure-Stake mechanism feature; this is a heavy duty OEM pump with high flow rate; 115V, 60Hz, 1½ HP, 23 Amps; requires hand or foot control.
13611	Hand Switch for 13810
13612	Foot Switch for 13810
13613	High Pressure, steel reinforced hydraulic hose; 6 ft.
13614	High Pressure, steel reinforced hydraulic hose; 10 ft.
13619	High Pressure, plastic hydraulic hose; 10 ft.
13600	This electric hydraulic pump is for use with all T&B hydraulic heads—consists of pump with pressure gage and Pioneer type male coupler; add suffix **WG** to eliminate gauge; output pressure 9800 PSI; order switch and hose separately.
13620	Hand Switch—10 ft
13589A	Foot Switch—10 ft
13619	10 ft. Non Metallic Hose
13618	20 ft. Non Metallic Hose

A remote control switch is required. Order Cat. No. 13620 for hand operation or Cat. No. 13589A for foot operation.
All pumps are supplied with a metal carrying case.

13610A	Shure-Stake® electric hydraulic pump has same features as 13600, but includes the Shure-Stake® control mechanism; prevents under crimping; (pump pressure must reach 9,800 psi before recycling); requires hand or foot control; order switch and hose separately.
13611	Hand Switch—10 ft
13612	Foot Switch—10 ft
13797	In line hydraulic pressure inspection gauge with male and female pioneer type coupler.

A remote control switch is required to operate this unit. Use either a #13611 (hand) or #13612 (foot) switch.

13610A

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Magnet Wire Connector/Tooling Cross Reference – Application Tools

Connector	Manual	ERG-3000	11903A 11904-A 13500	Strip	TBM6H	13100A	13400	TBM15
					Dies			
204210MT	–	–	–	–	–	–	13682	–
204210S	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204210SH	–	–	–	–	–	13673B	13673	13673B with 15500TB
204210-1	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204210-1H	–	–	–	–	–	13673B	13673	13673B with 15500TB
204210-2	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204210-3	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204210-3H	–	–	–	–	–	13673B	13673	13673B with 15500TB
204210-5	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204212	–	–	–	–	–	13671B	13671	13671B with 15500TB
204217	–	–	–	–	–	13671B	13671A	13671B with 15500TB
204MT14	–	–	–	–	–	–	–	–
204MT38	–	–	–	–	–	–	–	–
204T14	–	–	–	–	–	13689B	–	13689B with 15500TB
204T38	–	–	–	–	–	13689B	–	13689B with 15500TB
210214MT	–	–	–	–	–	13681B	13681	13681B with 15500TB
210214S	–	–	–	–	–	13670B	13670A	13670B with 15500TB
210214-2	–	–	–	–	–	13670B	13670A	13670B with 15500TB
210214-3	–	–	–	–	–	13670B	13670A	13670B with 15500TB
210216	–	–	–	–	–	13670B	13670A	13670B with 15500TB
210216F								
210217	–	–		–	–	13670B	13670A	13670B with 15500TB
210217F								
210219	–	–	–	–	–	13670B	13670A	13670B with 15500TB
210219F								
210MT14	–	–	–	–	–	–	–	–
210MT38	–	–	–	–	–	–	–	–
214420	ERG811/WT811	–	11956	–	–	–	–	–
220001	–	–	–	13678	–	–	–	–
220002-TB	–	–	–	13679	–	–	–	–
220004	–	–	–	13676A	–	–	–	–
220005	–	–	–	13690	–	–	–	–
220006	–	–	–	13696	–	–	–	–
220015	–	–	–	–	–	13713	–	13713
220016	–	–	–	–	–	13713	–	13713
220017	–	–	–	–	–	13713	–	13713
220018	–	–	–	–	–	13713	–	13713
220019	–	–	–	–	–	13713	–	13713
220020	–	–	–	–	–	13713	–	13713
220021	–	–	–	–	–	13713	–	13713
220022	–	–	–	–	–	13713	–	13713
220023	–	–	–	–	–	13713	–	13713
220024	–	–	–	–	–	13713	–	13713
220025	–	–	–	–	–	13713	–	13713
220026	–	–	–	–	–	13713	–	13713
22F061	ERG1801	–	13201	–	–	–	–	–
22F066	ERG1806	ERG206	13206	–	–	–	–	–
22F081	ERG1801	–	13201	–	–	–	–	–
22F086	ERG1806	ERG206	13206	–	–	–	–	–
22F101	ERG1801	–	13201	–	–	–	–	–
22F106	ERG1806	ERG206	13206	–	–	–	–	–
22L001	ERG1801	–	13201	–	–	–	–	–
22L002	ERG1802	ERG202	13202	–	–	–	–	–
22L004	ERG1804	–	–	–	–	–	–	–
22L006	ERG1806	ERG206	13206	–	–	–	–	–
22L008	–	–	–	–	6TON-MW-08	13683B	13683	13683B with 15500TB
22L009	–	–	–	–	6TON-MW-09	13684B	13684	13684B with 15500TB
22L009H	–	–	–	–	–	13686B	13686	13686B with 15500TB
22LF01	ERG1801	–	13201	–	–	–	–	–
22LF06	ERG1806	ERG206	13206	–	–	–	–	–
22LM01	ERG1801	–	13201	–	–	–	–	–
22LM06	ERG1806	ERG206	13206	–	–	–	–	–
22R061	ERG1801	–	13201	–	–	–	–	–
22R106	ERG1806	ERG206	13206	–	–	–	–	–
22R146	ERG1806	ERG206	13206	–	–	–	–	–
314118S	–	–	–	–	–	13685B	13685	13685B with 15500TB
314123	–	–	–	–	–	13685B	13685	13685B with 15500TB
314125	–	–	–	–	–	13685B	13685	13685B with 15500TB

Note: Dies that fit 13100A also work in TBM15 with use of adapter 15500TB.

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